



**WIRES YOU CAN TRUST,
QUALITY YOU CAN COUNT ON**

STRONG WIRES. STRONGER BONDS.





NABL

Natraj Industries has set a benchmark in product quality by achieving NABL (National Accreditation Board for Testing and Calibration Laboratories) accreditation, showcasing its capability to conduct international-level quality evaluations for wires and cables. Additionally, the company has a DSIR-recognized technology center within its cable division, reinforcing its commitment to innovation and excellence. NABL, an autonomous body under the Department of Science and Industrial Research (Government of India), oversees this accreditation.

As the first private facility of its kind in India, the NABL-accredited laboratory is fully equipped to meet international standards for testing a wide range of cables, up to 220 KV grade, PVC cables, flexible cables and fire survival cables. The lab adheres to Indian Standards. It also conducts eight types of fire tests to evaluate and demonstrate the fire-retardant behavior of cables.



ABOUT THE COMPANY

NATRAJ INDUSTRIES

Natraj Industries, a distinguished name in the cable manufacturing industry, is one of the oldest and most renowned manufacturers of electric wires, coaxial cables, submersible cables, XLPE insulated cables, and flexible cables in India.

Established in 1978 by its visionary founder, Shri Sudhir Kumar, the company has grown from humble beginnings to become a leader in its field. Shri Kumar's foresight, unwavering determination, and dedication, combined with the expertise of his professional team, state-of-the-art infrastructure, robust marketing network, and a commitment to customer satisfaction, have been the driving forces behind Natraj Industries' success. His focus on delivering consistent quality and economical solutions has elevated the business to remarkable heights.

As Natraj Industries approaches its Golden Jubilee, completing 47 illustrious years in the industry, it takes immense pride in having illuminated countless homes and establishments across the nation.

The company's flagship brands, Magdolin and Polostar, have become synonymous with quality and reliability, earning the trust and confidence of customers nationwide. Through its commitment to excellence, Natraj Industries continues to contribute significantly to India's growth and development.

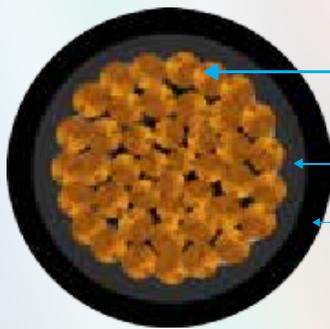


SOLAR CABLES

INTRODUCTION



The solar photovoltaic industry is rapidly gaining recognition as one of the most promising and environmentally friendly sectors, poised to play a crucial role in addressing the global energy crisis. As production costs continue to decrease, solar energy is increasingly seen by users as a clean, cost-effective, and reliable source of power. In this context, the demand for solar cables—the key medium for transmitting power in solar energy systems—is expected to rise significantly in line with the expanding market.



Flexible tinned copper stranded class -5 conductors as per IEC-60228

Insulation – Cross linked

Polyolefin, Natural Color*

Outer sheath – Cross linked

Polyolefin Black Color

**can be manufactured with Red/Black colour*

SPECIAL PROPERTIES OF SOLAR CABLE

- ✓ **Lifetime reliability:** lasts up to 25 years even under tough external conditions.
- ✓ **Outdoor durability:** resists extreme temperatures (-40 °C to 120 °C maximum at the core) and ozone resistant.
- ✓ **UV resistance:** full protection against ultraviolet rays.
- ✓ **Halogen-free:** Low Smoke Emission & Low Toxicity/Corrosivity during fire.
- ✓ **Properties against fire:** flame retardant, fire retar
- ✓ **Flexibility and stripability:** for fast and easy installation.
- ✓ **Fully recyclable:** in accordance with new environmental regulations.
- ✓ Easy installation with color identification (black, red)
- ✓ Suitable to common connector types and TÜV certified .

Constituents

Natraj Industries, Briston solar cables are manufactured with the following materials.

1. Annealed Tinned Copper Conductor.
2. Cross Linked Polyolefin Compound (Insulation and Sheathing).

Required Features of Solar Cables

Chemical Features

- Weather resistant
- Resistant to mineral oils
- Resistant to acids & alkaline

Thermal Features

- Maximum conductor temperature of operation -120 °C during 20000 hours.
- Minimum operating temperature: - 40 °C

Electrical Features

- Voltage rating:1.5 kV (1.8) kV dc / 0.6 kV/1.0 kV (1.2) kV ac
- High voltage test: 6.5 kV dc for 5 minutes.

Mechanical Features

- Resistant to Impact, tear & abrasion
- Minimum bending radius – 8 times of overall diameter
- Safe pulling force -50 N/sq. mm

Tests and Ratings of Ratings of Solar Cables

Severe Weather Resistance



Maximum Conductor Temperature
120 °C IEC 60216



Resistance to Extreme Temperatures
Minimum:-40 °C IEC 60811-1-4



Resistance to Ultraviolet
Rays (UV) UL 1581



Resistance to Ozone
IEC 60811-2-1



Resistance to Water Absorption
IEC 60811-1-3

TESTS AND RATINGS OF RATINGS OF SOLAR CABLES

Life Expectancy



Design Life Time 30 Years
IEC 60216

Mechanical Resistance



Impact Resistance
IEC 60811-1-4



Abrasion Resistance
EN 50305



Tear Resistance
IEC 61034-2

Severe Weather Resistance



Environment-Friendly



Halogen Free
IEC 60754-1



Low Corrosive Gas Emission
IEC 60754-2



Low Smoke Opacity
IEC EN 61034-2



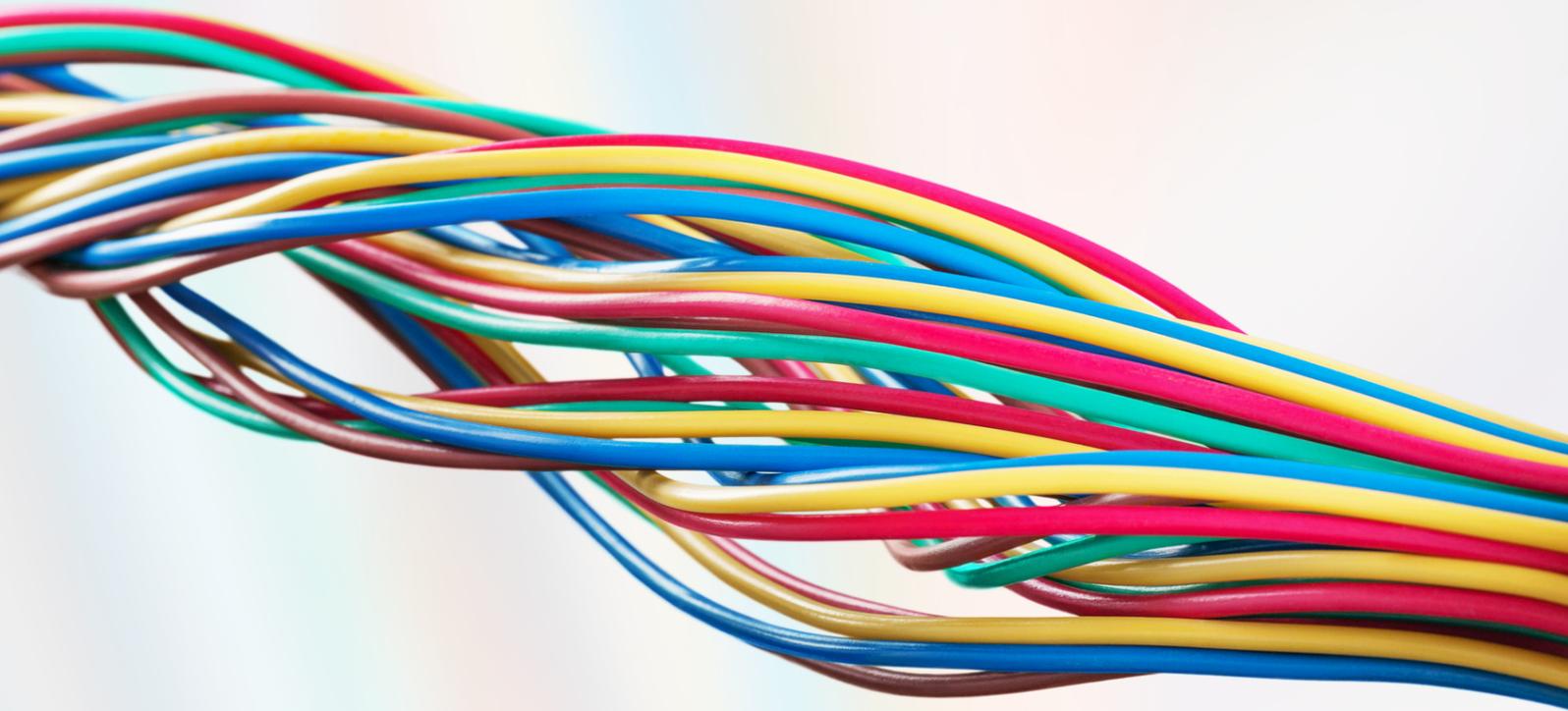
Non Fire Propagation
IEC 60332-3

REQUIRED FEATURES OF SOLAR CABLE

SIZE cross-sectional area in	Max. Conductor D.C. Resistance at 20°C	Average Diameter of Conductor	Approximate Overall Diameter		Minimum Bending Radius	Current Rating for Single Cable Free in Air	Short circuit current rating for 1 second duration
(Sq.mm)	(Ω/km)	(mm)	(mm)		(mm)	(A)	(kA)
1.5	13.7	1.46	4.46	4.86	38.88	30 A	0.189
2.5	8.21	1.88	4.88	5.08	42.24	41 A	0.315
4.0	5.09	2.41	5.41	5.61	46.32	55 A	0.504
6.0	3.39	2.95	5.95	6.15	50.64	70 A	0.756
10	1.95	3.86	7.26	7.66	61.28	98 A	1.26
16	1.24	5.39	8.79	9.19	73.52	132 A	2.02
25	0.795	6.73	10.53	11.13	89.04	176 A	3.15
35	0.565	8.08	11.88	12.48	99.84	218 A	4.41
50	0.393	9.69	13.49	14.09	112.72	276 A	6.30
70	0.277	11.54	15.34	15.94	127.52	347 A	8.82
95	0.210	13.25	17.05	17.85	142.8	416 A	11.97
120	0.164	15.00	18.80	19.60	156.8	488 A	15.12
150	0.132	16.77	21.37	22.37	178.96	566 A	18.90
185	0.108	18.54	23.54	24.54	196.32	644 A	23.31
240	0.0817	21.33	26.33	27.33	218.64	775 A	30.24



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